**3.4 – Predicting Products of Reactions – Practice**

For the following reactions, predict the products and balance the equations.

Synthesis

1. 4 Na + 1 O2 🡪 2 Na2O
2. 2 NaCl + 3 O­2 🡪 2 NaClO­3
3. 1 BeO + 1 CO2 🡪 1 BeCO3

Single Replacement

1. 2 Al + Pb(NO3)2 🡪 3 Pb + 2 Al(NO3)3
2. Cu + AlCl3 🡪 no reaction, Cu cannot replace Al
3. I2 + MgCl2 🡪 no reaction, I cannot replace Cl
4. 1 Br2 + 1 CaI2 🡪 1 I2 + 1 CaBr2
5. 2 Al + 6 HCl 🡪 2 AlCl3 + 3 H2

Double Replacement

1. 3 Ca(OH)2 + 2 H3PO4 🡪 1 Ca3(PO4)2 + 6 H2O
2. 1 Na2CO3 + 1 H2SO4 🡪 1 Na2SO4 + 1 H2CO3
3. 1 Al2(SO4)3 + 1 Ca3(PO4)2 🡪 2 AlPO4 + 3 CaSO4
4. 1 Co(OH)3 + 3 HNO3 🡪 1 Co(NO3)3 + 3 H2O
5. 1 K2CO3 + 1 BaCl2 🡪 2 KCl + 1 BaCO3

Decomposition

1. 2 K3N 🡪 6 K + 1 N2
2. 1 BaCO3 🡪 1 BaO + 1 CO2
3. 2 H2O 🡪 2 H2 + O2

Combustion

1. 2 C6H6 + 15 O2 🡪 12 CO2 + 6 H2O
2. 1 C25H52 + 38 O2 🡪 25 CO2 + 26 H2O
3. 1 C4H9OH + 6 O2 🡪 4 CO2 + 5 H2O

Acid-Base

1. 1 HBr + 1 KOH 🡪 1 KBr + 1 H2O
2. 2 HNO3 + 1 Ca(OH)2 🡪 1 Ca(NO3)2 + 2 H2O

Predict the products of the following reactions, and identify the reaction type.

1. 1 Ca + 1 Cl2 🡪 1 CaCl2 **Synthesis**
2. 1 C3H8 + 5 O2 🡪 3 CO2 + 4 H2O **Combustion**
3. 3 BaBr2 + 2 AlPO3 🡪 2 AlBr3 + Ba3(PO3)2 **Double Replacement**
4. KNO3 + Al 🡪 no reaction **Single Replacement (but does not happen)**
5. 2 Li + 1 CaO 🡪 1 Ca + 1 Li2O **Single Replacement**
6. 2 Al + 3 Cl2 🡪 2 AlCl3 **Synthesis**
7. 1 MgCl2 + 3 O2 🡪 1 Mg(ClO3)2 **Synthesis**
8. 2 CuO 🡪 2 Cu + 1 O2 **Decomposition**
9. 3 Fe(NO3)2 + 2 Na3PO4 🡪 1 Fe3(PO4)2 + 6 NaNO3 **Double Replacement**
10. 2 Al + 3 H2SO4 🡪 3 H2 + Al2(SO4)3 **Single Replacement**
11. Zn + Ca(NO3)2 🡪 no reaction **Single Replacement**
12. 1 C10H21OH + 15 O2 🡪 10 CO2 + 11 H2O **Combustion**
13. 1 H2SO4 + 2 NaOH 🡪 1 Na2SO4 + 2 H2O **Acid-Base**
14. 1 PbO2 🡪 1 Pb + 1 O2 **Decomposition**
15. 1 Mg + 2 HCl 🡪 1 MgCl2 + 1 H2 **Single Replacement**
16. Hydrogen phosphate and calcium hydroxide react

**2 H3PO4 + 3 Ca(OH)2 🡪 1 Ca3(PO4)2 + 6 H2O**

**Acid-Base reaction**

1. Hydrogen iodide decomposes

**2HI 🡪 1 H2 + 1 I2**

**Decomposition**

1. Carbon dioxide reacts with water

**1 CO2 + 1 H2O 🡪 1 H2CO3**

**Synthesis**

1. Chlorine is combined with aluminum fluoride

**Cl2 + AlF3 🡪 no reaction**

**Single Replacement (but does not happen)**